National Aeronautics and Space Administration

MARSHALL STAR

Serving the Marshall Space Flight Center Community

Sept. 10, 2009

Discovery undocks from station; landing set Sept. 10

Marshall's research rack delivered, installed on space station

By Sanda Martel

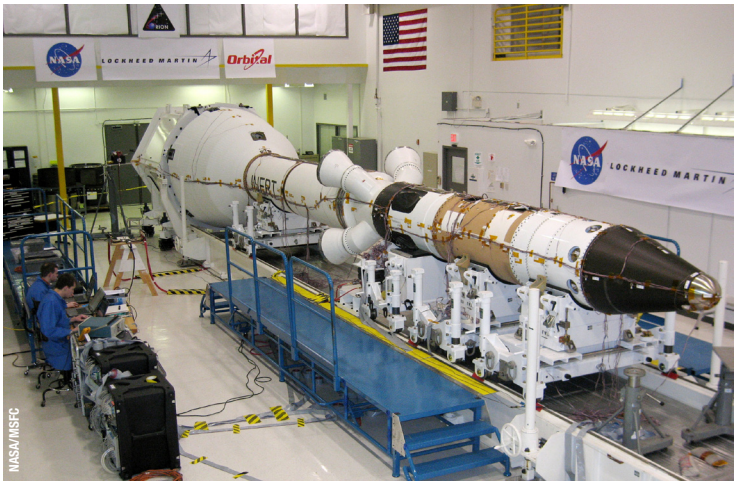
Space shuttle Discovery undocked from the International Space Station on Sept. 8 after completing nine days of a mission that included delivering the Materials Science Research Rack to the station. The rack was developed and is managed by the Marshall Space Flight Center.

At Marshall Star press time, landing was scheduled for Sept. 10 at 6:05 p.m. CDT at the Kennedy Space Center, Fla.

*See **STS-128** on page 5*

Space shuttle Discovery moves behind the International Space Station's Japanese Kibo module during a fly-around after undocking Sept. 8.

Marshall launch abort team moves forward with design



Technicians from ATA Engineering Inc. assess data collected during the ground vibration test of the Orion Launch Abort System. The 53-foot-long inert assembly was tested at Orbital Sciences Corporation's facility in Dulles, Va.

By Kim Newton

Engineers at the Marshall Space Flight Center responsible for developing propulsion elements for the Orion crew capsule's launch abort system passed a major milestone Aug. 31 with the completion of Orion's Preliminary Design Review.

The launch abort system is the critical element of the Orion capsule that will pull its crew safely away from the Ares I rocket in the event of an emergency. Orion is the next-generation spacecraft designed to carry astronauts to the International Space Station and other destinations. The Marshall Center provides government oversight of the motors that power the abort system, and has a supporting role in thermal, structures, mechanisms, avionics, systems engineering, flight testing and ground operations.

*See **Abort system** on page 5*

NASA test series steps closer to power option for moon habitat

From combined reports

NASA has made a series of critical strides toward development of new nuclear reactors the size of trash cans, capable of powering a human outpost on the moon or Mars.

Three recent tests at different NASA centers and a national lab successfully demonstrated key technologies required for compact, fission-based nuclear power plants for human settlements on other worlds.

The Marshall Space Flight Center offers a one-of-a-kind test facility that enables engineers to simulate the nuclear power process of heat transfer from a reactor to a power converter, without the use of nuclear materials.

Reviewing test results on the Stirling engine are Boise Pearson, left, team lead for the Fission Surface Power Test Facility, and Mike Houts, project manager for nuclear systems at Marshall. At far right is Kurt Polzin, a Marshall research scientist.

"The recent tests bear out that a fission surface power system could be an important source of energy for exploration on the moon and Mars," said Mike Houts, project manager for nuclear systems in the Science & Mission Systems Office at Marshall. "This power system could provide an abundant source of reliable, cost-effective energy and may be used anywhere on the lunar surface."

For this particular test series, the Marshall reactor simulator was linked to a Stirling engine, developed by NASA's Glenn Research Center in Cleveland. The Stirling engine, named for 19th-century industrialist and inventor Robert Stirling, converts heat into electricity.

The Marshall reactor simulator included a specialized pump, provided by the U.S. Department of Energy, and a coolant loop filled with a mixture of sodium and potassium. The coolant loop provided heat to the Stirling engine at conditions very similar to an actual fission-based surface power system. The joint testing helped resolve potential integration issues, Houts said, and provided information and experience needed to reduce technology risks associated with this system concept.

The testing of the Stirling engine with the Marshall reactor simulator may well be a key factor in demonstrating the readiness of fission surface power technology, Houts said, and could provide NASA with an efficient and robust system to produce power in the harsh environment on the moon and Mars.

NASA's current plan for human space exploration is to return astronauts to the moon by 2020 on expeditions that could lead to a permanent outpost for exploring the lunar surface and testing technologies that could aid a crewed mission to Mars.

The space agency has been studying the feasibility of using nuclear fission power generators to support those future outposts. Engineers performed the recent tests as part of a joint effort by NASA and the Department of Energy.

Nuclear fission power plants work by splitting the nuclei of atoms in a sustainable, controllable reaction that releases heat, which then can be funneled through a power converter to become usable electricity.

"A small, fission-based nuclear reactor coupled with a Stirling engine could provide up to 40 kilowatts of usable energy, enough to support a moon base or Mars outpost," Houts said. That's about the same amount of power needed to supply eight houses on Earth, he said.

The test series was conducted as part of the fission-based surface power project, part of NASA's Exploration Technology Development Program, which is tasked with developing advanced technologies that will enable NASA to conduct future human exploration missions, while reducing mission risk and cost.

The next step for NASA's fission power project is to combine its radiator, engine and alternator successes into a single, non-nuclear power plant demonstration. That test is slated to begin in 2012, NASA officials said.

At annual awards luncheon

Shuttle Propulsion Office honors team members

By Sanda Martel

The Marshall Space Flight Center's Shuttle Propulsion Office recognized its outstanding employees at an awards luncheon Aug. 13 at the Holiday Inn Express in Huntsville.

The Shuttle Propulsion Office at Marshall is responsible for the design, development, testing and flight performance of the space shuttle main engines, external tank and solid rocket boosters with their reusable solid rocket motors.

Steve Cash, manager of the Shuttle Propulsion Office, welcomed some 220 employees and guests.

He thanked team members for their dedication to the space shuttle's safe flight. "We have had a very good year. You have a lot to be proud of and I am very grateful to lead this team," Cash said.

"This is a unique time to be a part of the Space Shuttle Program, and we're going to end this program on a high note," he added, referring to completion of NASA's remaining shuttle missions in 2009 and 2010. "I know you will remain focused on the important work you do each day and will make our remaining missions safe and successful."

Tom Milner of the Reusable Solid Rocket Booster Project Office, was presented the 2008-2009 Shuttle Employee of the Year award. He was chosen by his co-workers from among the Shuttle Employee of the Month honorees for the period.

Eight employees, nominated by their peers, received the 2009 Teamwork Excellence Award. Recipients included shuttle program team members Yolanda Harris, Office of the Manager; Teresa Scogin, Program Planning and Control Office; Patrick Molloy, Engineering Directorate, for duties performed while detailed to the Marshall Center Resident Office at the Kennedy Space Center, Fla.; Steve Glover, Propulsion Systems Engineering and Integration Office; Carol Bryant, Space Shuttle Main Engine Project Office; Jane Holland, External Tank Project Office; Shawn Holcomb, Propulsion Systems Engineering and Integration Office; and Scott Finnegan, Reusable Solid Rocket Booster Project Office.


Doug Stoffer/MSFC

Steve Cash, manager of the Marshall Center's Shuttle Propulsion Office, congratulates team members for their outstanding work in 2009.

The 2009 Team Excellence Award was presented to the External Tank Manufacturing Support and Facility Operating Contract Project Team.

Team members receiving Certificates of Appreciation for their work were Mike Allen, Shuttle Transition Office; Beth Allison, Len Bell, John Honeycutt, John Kress, John Chapman, John Rector, Richard Sheppard, Brian Collins, Jeff Irby and Patrick Whipps, External Tank Project Office; Bill Hicks, Program Planning and Control Office; Mary Cooper and Kellie Craig, Office of Procurement; Stephen Brooks, DPA Associates of Huntsville; Jerry Laurine and Cody McPeters, Digital Fusion Solutions Inc. of Huntsville; and Larry Caddy, GeoLogics Corp. of Huntsville.

Entertainment was provided by vocalist Sharon Hancock, an employee of UNITeS of Huntsville.

Martel, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.


Doug Stoffer/MSFC

Shuttle Propulsion Office team members enjoy food during the awards luncheon.

Physical inventory of NASA bar-coded property to begin Oct. 1

A physical inventory of all NASA-tagged, bar-coded property at the Marshall Space Flight Center will begin Oct. 1. The inventory will be conducted by Marshall's Logistics Services Office, part of the Office of Center Operations.

All equipment in team members' file cabinets, desks and other storage areas must be made available for scanning by the inventory teams. All controlled equipment documented on an individual's "Mobile Equipment Property Pass" also must be made available for inventory. Property passes are assigned to those people carrying government equipment on or off Redstone Arsenal.

The Logistics Service Office has posted the 2009 physical inventory schedule on Inside Marshall. Managers are asked to review the schedule and inform their employees, including contractors and off-site workers, of the inventory schedule for their department. If absences are anticipated during an inventory visit, users must make arrangements with management for an alternate time.

For more information, visit Inside Marshall or http://inside.msfc.nasa.gov/announcements/2009_physical-inventory.html. For questions, contact Inge Kuberg at 544-5678 or Amanda Overcast at 544-3193 prior to the scheduled visit.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Sept. 17, is 4:30 p.m. Thursday, Sept. 10.

Miscellaneous

Recumbent exercise bike with several programs, will deliver, $200. 931-427-8048

Casa Blanca wedding dress, size 8, $650; two Alfred Angelo dresses, knee length, size 6-8. 217-0811

Oak-framed oval mirror, hangs vertical/horizontal, $35; two swivel-back bar stools, matching desk chair, $100. 656-8507

Beagle pup, female, 7 weeks old. 444-0514

AWS pickup truck aluminum tool box, fits full-size trucks, $150. 684-9545

Snapper high-vacuum riding mower, 30-inch cut, needs new engine, $100. 325-0085

Storage rack for free weights, sturdy metal frame with pegs, $25. 651-5847

Step2 Lifestyle Dream Kitchen, ages 2 plus, $75, 777-1810 http://www.step2.com/product.cfm?product_id=1283

Brown leather loveseat couch, $75. 679-8110

Futon bed, $35. 348-1809

Daybed, trundle, two mattresses, comforter, three pillow shams, twin sheet sets, twin blankets, $300. 232-8307

Meade ETX125PE telescope, 5 inches, UHTC, Autostar, case, tripod, Motofocus, cables, two eyepieces, manuals, $750. 858-6135

Weider three-station weight machine, $165. 617-1936

Hotpoint electric dryer, $50 obo. 337-9222

Solid oak Queen Anne dining table, six fiddleback Windsor chairs, $650 obo. 347-1674

Full-size bed frame, back board, honey maple, $50 obo. 325-6719

Fender seven-piece drum set, $500. 303-2085

Broyhill white kitchen hutch, glass sides/doors/shelves, $350; five-piece white indoor wicker set, $350. 975-1667

Two Auburn/Miss. St. tickets, section 60, row 20, face value at $55/ticket. 772-3140

20-inch television with remote, $50. 684-7936

Vehicles

2007 Yamaha YZF R6, helmet, tank pack, 1,780 miles, $6,450 obo. 278-0607

2006 Chrysler Pacifica Touring, third row, red, 25k miles, $13,000. 797-1300

2004 Yamaha V-Star 1100, two-tone paint, accessories, $4,700. 656-4637

2004 Motorhome, R-Vision 33' Class-A, workhorse chassis, extended warranty, www.thewillettfamily.com/rv, $52,000. 883-7021

2003 Toyota Camry LE, 94k miles, $6,995; 1998 Ford Escort ZX2, 100k miles, $2,500. 890-0981

2002 Acura MDX Touring, white, DVD with wireless headphones, 98,800 miles, $12,500. 425-3802

2000 Jeep Grand Cherokee Laredo, gray, six cylinder, 2WD, air conditioning, $3,350. 541-2555

1999 Toyota Pre-runner, A/T, A/C, CD, tow package, 137,600 miles, $5800. 830-6584

1998 Stingray RS180, 140hp, bimini top, ski equipment, $10,000 obo. 640-6427

1997 Honda Recon 250 4-wheeler, $1,200. 655-6348

1995 Mustang V6, runs, cold A/C, needs work, 165k miles, $1,150. 975-9480

1987 Toyota Supra, Targa top, auto, good condition, $2,000 obo. 652-0598

Yamaha TTR-50 mini dirt bike, electric start, $700. 636-1533

Wanted

Furniture donation: sectional couch, recliners, tables/lamps, two queen futons, one king bed, patio, dining. 631-8915

Archery targets and hunting supplies, climbing, ladder or lock-on stands. 303-7952

Minivan or van with a wheelchair lift. 883-7173

Tennis partner, beginner level. 321-258-4524

Filing cabinet, wood preferable. 772-7222

Houses/offices to clean, available evenings, weekends, gift certificates available. 777-8595

Free

Kittens, found on side of road, approximately 7-8 weeks old. 859-0237

Found

$10, Building 4203 elevator, Aug. 19. 544-3749

STS-128 *Continued from page 1*

The research rack brings the space station "one step closer to being a robust orbiting laboratory," said Jimmie Johnson, Marshall project manager. It will allow scientists to use the microgravity environment to isolate chemical and thermal properties of materials free from the effects of gravity, Johnson added. The rack will facilitate the research by providing instrumentation and thermal chambers for mixing materials, growing crystals and quenching/solidifying metals or alloys.

Riding to the station inside the Leonardo Multi-Purpose Logistics Module, the Materials Science Research Rack will be used for basic materials research related to metals, alloys, polymers, semiconductors, ceramics, crystals and glasses in the microgravity environment. Leonardo serves as a large moving van – ferrying supplies and equipment back and forth from the space station.

During the 13-day STS-128 mission, astronauts completed three spacewalks, delivered a new crew member to the space station, and transferred more than 7 tons of equipment and supplies, science racks and environmental hardware to sustain six crew members on the orbital outpost.

The astronauts completed three spacewalks during the mission. On Sept. 1, spacewalkers removed an empty ammonia tank from the space station's P1 truss. The truss is part of the space station's backbone that provides structural integrity. During the second spacewalk on Sept. 3, the astronauts installed a new ammonia tank assembly. The tank contains 600 pounds of ammonia to provide proper cooling for the thermal control system in the truss.

During the third spacewalk, on Sept. 5, astronauts began preparations for the arrival of the Node 3 connecting module, dubbed Tranquility, and its cupola viewing port. Tranquility, scheduled for launch in 2010, is a pressurized module that will provide room for many of the space station's life support systems. Attached to the node is the cupola, a unique work station with six windows on the sides and one on top. The windows will provide unique viewing opportunities for astronauts on the space station.

Preparations are under way at Kennedy for the launch of space shuttle Atlantis on the next mission to the International Space Station, STS-129, targeted to lift off in November.

Martel, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

Abort system *Continued from page 1*

The Preliminary Design Review is an early, comprehensive review of the space vehicle's design, preceding the detailed design process.

The launch abort system includes three motors: an abort motor that pulls the Orion capsule out of danger; an attitude control motor to provide directional control; and a jettison motor that separates the system from the crew module.

In the event of a launch failure, the main abort motor will ignite, producing more than a half-million pounds of thrust within milliseconds, to pull the Orion capsule away from the launch vehicle. Once the crew module has been reoriented for landing, the abort system will be jettisoned and parachutes will slow the capsule's descent for a safe landing.

Approximately 50 people on the Orion abort system team took part in documentation reviews to ensure the system design is safe and meets all NASA requirements. The team identified potential gaps in the design and addressed ways to reduce those gaps as the design goes forward.

The next major review the abort system team is working toward is the Orion Critical Design Review, scheduled for February 2011. That milestone will demonstrate that the system's design is mature and ready for full-scale fabrication, assembly, integration and testing.

A full-scale test of the launch abort system, or Pad Abort 1, is scheduled early next year at the U.S. Army's White Sands Missile Range in New Mexico. This test will be the first full-scale test flight of the new system, simulating an emergency abort scenario from the launch pad, using a full stack of Orion and the launch abort system.

Development of the launch abort system is being led by the Exploration and Flight Projects Directorate at Langley Research Center in Hampton, Va., on behalf of the Orion Project at Johnson Space Center in Houston.

Newton is a public affairs officer in the Office of Strategic Analysis & Communications.

'Pick your veggies' at Marshall Exchange Farmer's Market

Cars won't be the only things in the south parking lot of Building 4203 every Wednesday for the next few weeks. From 11 a.m. to 3 p.m., the Marshall Exchange Farmer's Market will offer fresh vegetables, fruit, cheese, baked goods, canned goods and flowers for sale from local farmers. Cory Watson, left, an engineer with the Colsa Corp., supporting Marshall's Engineering Directorate, looks over fresh vegetables, as Katie Isble of Shrader Farms in Hazel Green, Ala., organizes the produce. Also bringing fresh Alabama goods to the Marshall market are Humble Heart Farms of Elkmont, Bright Earth Farms of Bremen, Spradlin Farms of Vinemont, Gypsy Ranch of Altoona, and Brosmer Farms of Huntsville. This is the first year for the Farmer's Market at Marshall. It opened May 27, and is expected to continue through the last week of October or the first week of November. The last day will be announced on Inside Marshall.

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